

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

A new or improved process for the production of Dolls and other Toys

We, THE CHAD VALLEY COMPANY, LIMITED, a British Company of Chad Valley Works, Harborne, Birmingham, 17, in the County of Warwick, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to a new or improved process for the production of dolls and other toys and is an improvement in or modification of the invention forming the subject of our prior patent 15 No. 517,252 in the complete specification of which we have described and claimed a process for producing dolls, doll's head and limbs, toys and other articles in which it is desired to reproduce comparatively soft and unbreakable surfaces consisting in employing a mould of configuration corresponding to that of the article to be reproduced and from same 20 producing a hollow rubber reproduction by pouring latex into the mould to form a deposit on the inner wall of the mould, and after setting, filling the hollow reproduction with a soft filling material and closing the filling aperture with a closure 25 which may be sealed with a film of latex or other suitable material.

30 In the prior specification aforesaid we have described and claimed the above process only in the production of rubber articles by the pouring of latex into the 35 mould but we have now found that the process described in our prior specification aforesaid can be developed successfully using as the raw material, in place of latex, a polyvinyl chloride resin, plasticised with a suitable plasticizer as to provide the desired physical properties in the finished article.

40 We do not in the present specification make any broad claim to the use of poly-

vinyl chloride resin in the production of dolls and other toys. The use of polyvinyl chloride resins for the production of dolls, toys, as well as other hollow moulded articles has previously been disclosed in a number of prior United Kingdom specifications, and the present invention is concerned solely with a development as hereinafter more particularly explained of the prior process the subject of our prior patent aforesaid and is further confined specifically to the production of dolls and other toys.

According to the present invention we provide a process for producing dolls and other toys including parts thereof such as dolls' heads, which process comprises employing a hollow mould of configuration corresponding to the exterior of the toy or part thereof to be produced, pouring in liquid form into the mould and so as to leave a filling opening, a polyvinyl chloride resin plasticized sufficiently to form an elastomer on subsequent heating to a predetermined degree, gelling the resin plasticizer mixture adjacent the mould surface to a thickness sufficiently thin to ensure that the finished article is capable of being readily deformed when handled by a child or infant, draining off the excess mixture, heating the gelled layer to convert it into a solid elastomer, removing the so formed hollow article from the mould and filling its hollow interior with a soft filling material adapted to ensure that the toy or part thereof reverts to its initial shape after pressure exerted thereon by a child or infant is removed, and closing the filling opening to retain the filling material within the hollow interior of the toy or part thereof.

The gelling of the polyvinyl chloride plasticizer mixture is conveniently effected by heating the mould so as to

heat that part of the mixture which is adjacent the interior surface of the mould at a temperature and for a time dependent upon the composition of the mixture and the degree of thinness of the finished article which is required.

Conveniently the process is carried out in a metal mould which may be formed of two parts which can be moved relatively apart at the conclusion of the moulding operation, or alternatively, a one-piece mould may be used in which case removal of the finished article would be effected by deforming the article temporarily and withdrawing it through the filling opening in the mould.

Instead of using a metal mould, the mould whether a one-part or a two-part mould may be made from various forms of plaster or cement and the moulded surface may be formed of nickel or other suitable metal which is electro deposited on a plaster cast.

We prefer to use as the raw material the particular polyvinyl chloride paste manufactured and sold by Imperial Chemical Industries Limited, under the registered trade mark "Welvic" having a viscosity at 250° C. of 70 to 110 poises and suitably pigmented to the colour desired in the finished article.

In one preferred example of carrying out the present invention as applied, for example, to the manufacture of a doll's head including a neck integral with the head, a two-part metal mould having an internal configuration corresponding to that of the head to be formed is employed, the two-part mould being provided with a filling opening which corresponds with the neck of the doll's head.

The two parts of the mould are now tightly secured together and the mould is then heated to a temperature of approximately 160° C. for a time sufficient to raise the inner or moulding surface of the mould approximately to this temperature, the period of heating being dependent upon the amount of metal in the mould, the wall thickness of the mould itself and its thermal conductivity.

The heated mould is now filled through the filling opening referred to with the preferred polyvinyl chloride paste above mentioned. The polyvinyl chloride paste which is immediately adjacent to the heated mould surface will thereupon be itself heated and gelled and as soon as the paste has been gelled to a sufficient thickness, which may, for example, be of the order of one sixty-fourth of an inch, the mould is inverted so as to drain off the excess paste leaving the thin gelled layer on the inner surface of the mould.

In practice it will be found that the

excess paste must be poured off a very short time, namely of the order of a few seconds only, after the mould has been initially filled, the time interval being dependent upon the desired wall thickness in the finished article.

The mould is now heated again to a temperature of approximately 160° C. for a period of twenty to thirty minutes so as to effect curing of the gelled layer on the interior of the mould and after this curing operation has been completed the mould is allowed to cool or is preferably chill cooled to room temperature whereupon the dolls head carcass so formed is removed from the mould and thereafter is filled with cotton wool, kapok or other suitable soft filling material as described in our prior patent specification aforesaid.

Finally the neck opening in the doll's head is closed and such closure may be effected by stretching the neck so as to contract it over a disc or other rigid closure member provided on the end of a corresponding neck portion of the doll's trunk so that the head is assembled in position on the trunk and the filling opening in the head closed at the same time.

Finally the head is suitably coloured on its exterior to provide the desired natural representations.

Heads of other toys such as, for example, animals may be formed in the same way as dolls' heads and secured as above described to separately formed trunks to form a complete toy.

Other parts of toys both in the form of dolls and other shapes may be formed similarly by the present invention which may be applied to the production of one-piece complete dolls and other toys formed of an elastomer made as above described.

The characteristics of dolls and other toys made in accordance with the present invention as well as with the prior specification aforesaid, are that the material forming the toy is of sufficient thinness as readily to be deformed under the small pressure exerted by the fingers of an infant as well as by an older child so that a very soft toy well adapted for use by infants and young children is provided, but at the same time by filling the interior of the toy with a soft filling material permanent deformation of the toy is prevented, the toy reverting to its original shape under the internal pressure exerted by the filling material when the external pressure of the child or infant is removed the amount of filling material which is inserted into the hollow interior of the polyvinyl chloride resin elastomer being

carefully predetermined so as to achieve this result

Thus there is produced a toy which is essentially of a soft and cuddly character whose softness and suppleness simulates that of a human baby which toy further possesses very little weight so that it is eminently suitable for use by young children

What we claim is:—

1. A process for producing dolls and other toys including parts thereof such as dolls' heads, which process comprises employing a hollow mould of a configuration corresponding to the exterior of the toy or part thereof to be produced, pouring in liquid form into the mould and so as to leave a filling opening, a polyvinyl chloride resin plasticized sufficiently to form an elastomer on subsequent heating to a predetermined degree, gelling the resin plasticizer mixture adjacent the mould surface to a thickness sufficiently thin to ensure that the finished article is capable of being readily deformed when handled by a child or infant, draining off the excess mixture, heating the gelled layer to convert it into a solid elastomer, removing the so formed hollow article from the mould and filling its hollow interior with a soft filling material adapted to ensure that the toy or part thereof reverts to its initial shape after pressure exerted thereon by a child or infant is removed, and closing the filling opening to retain the filling material within the hollow interior of the toy or part thereof.

2. A process according to Claim 1 wherein the gelling of the polyvinyl chloride plasticizer mixture is effected by

heating the mould.

3. A process according to Claim 1 or 2 wherein a one-piece mould is used, removal of the finished article being effected by deforming the article temporarily and withdrawing it in the deformed state through the filling opening of the mould.

4. A process according to any of the preceding claims wherein the resin plasticizer mixture employed comprises the polyvinyl chloride paste sold under the trade name "Welvic" having a viscosity at 250° of 70 to 110 poises.

5. A process of producing heads of dolls or the like according to any of the preceding claims wherein the filling opening in the formed head is constituted by the interior of the neck portion of the head, which opening is closed by stretching the neck portion so as to contract it over a disc or other rigid closure member provided on the end of a neck portion of a doll's or like trunk so that the head is assembled in position on the trunk to form a complete doll or the like and the filling opening is closed at the same time.

6. A process of producing a doll's head substantially as hereinbefore described with reference to the foregoing preferred example.

7. Dolls and other toys or parts thereof when produced by the process set forth in any of the preceding claims.

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PROVISIONAL SPECIFICATION

A new or improved process for the production of Dolls and other Toys

We, THE CHAD VALLEY COMPANY, LIMITED, a British Company of Chad Valley Works, Harborne, Birmingham, 17, in the County of Warwick, do hereby declare this invention to be described in the following statement:—

This invention relates to a new or improved process for the production of dolls and other toys and is an improvement in or modification of the invention forming the subject of our prior patent No. 517,252, in the complete specification of which we have described and claimed a process for producing dolls, dolls' heads and limbs, toys and other articles in which it is desired to reproduce compara-

tively soft and unbreakable surfaces consisting in employing a mould of the article to be reproduced and from same producing a hollow rubber reproduction by pouring latex into the mould to form a deposit on the inner wall of the mould, and after setting, filling the hollow reproduction with a soft filling material and closing the filling aperture with a closure which may be sealed with a film of latex or other suitable material.

In the prior specification aforesaid we have described and claimed the above process only in the production of rubber articles by the pouring of latex into the mould but we have now found that the

process described in our prior specification aforesaid can be developed successfully using as the raw material, in place of latex, a polyvinyl chloride resin. plasticised with a suitable plasticizer as to provide the desired physical properties in the finished article.

The present invention comprises such development of the prior process above referred to and is confined specifically to the production of dolls and other toys.

According to the present invention we provide a process for producing dolls and other toys including parts thereof such as dolls' heads, which process comprises employing a hollow mould of configuration corresponding to the exterior of the toy or part thereof to be produced, pouring in liquid form into the mould and so as to leave a filling opening, a polyvinyl chloride resin plasticized sufficiently to form an elastomer on subsequent heating to a predetermined degree, gelling the resin plasticizer mixture adjacent the mould surface to a thickness sufficiently thin to ensure that the finished article is capable of being readily deformed when handled by a child or infant, draining off the excess mixture, heating the gelled layer to convert it into a solid elastomer, removing the so formed hollow article from the mould and filling its hollow interior with a soft filling material adapted to ensure that the toy or part thereof reverts to its initial shape after pressure exerted thereon by a child or infant is removed, and closing the filling opening to retain the filling material within the hollow interior of the toy or part thereof.

The gelling of the polyvinyl chloride plasticizer mixture is conveniently effected by heating the mould so as to heat that part of the mixture which is adjacent the interior surface of the mould at a temperature and for a time dependent upon the composition of the mixture and the degree of thinness of the finished article which is required.

Conveniently the process is carried out in a metal mould which may be formed of two parts which can be moved relatively apart at the conclusion of the moulding operation, or alternatively, a one piece mould may be used in which case removal of the finished article would be effected by deforming the article temporarily and withdrawing it through the filling opening in the mould.

Alternatively, the mould may be made from various forms of plaster or cement and the moulded surface may be formed of nickel or other suitable metal which is electro deposited on a plaster cast.

We prefer to use as the raw material

the particular polyvinyl chloride paste manufactured and sold by Imperial Chemical Industries, Limited, under the trade name "Welvic" having a viscosity at 250° C. of 70 to 110 poises and suitably pigmented to the colour desired in the finished article.

In one particular method of carrying out the present invention as applied, for example, to the manufacture of a doll's head including a neck integral with the head, a two part metal mould having an internal configuration corresponding to that of the head to be formed is employed, the two part mould being provided with a filling opening which corresponds with the neck of the doll's head.

The two parts of the mould are now tightly secured together and the mould is then heated to a temperature of approximately 160° C. for a time sufficient to raise the inner or moulding surface of the mould approximately to this temperature, the period of heating being dependent upon the amount of metal in the mould, the wall thickness of the mould itself and its thermal conductivity.

The heated mould is now filled through the filling opening referred to with the preferred polyvinyl chloride paste above mentioned. The polyvinyl chloride paste which is immediately adjacent to the heated mould surface will thereupon be itself heated and gelled and as soon as the paste has been gelled to a sufficient thickness, which may, for example, be of the order of one sixty-fourth of an inch, the mould is inverted so as to drain off the excess paste leaving the thin gelled layer on the inner surface of the mould.

In practice, it will be found that the excess paste must be poured off a very short time, namely of the order of a few seconds only, after the mould has been initially filled, the time interval being dependent upon the desired wall thickness in the finished article.

The mould is now heated again to a temperature of approximately 160° C. for a period of twenty to thirty minutes so as to effect curing of the gelled layer on the interior of the mould and after this curing operation has been completed the mould is allowed to cool or is preferably chill cooled to room temperature whereupon the doll's head carcass so formed is removed from the mould and thereafter is filled with cotton wool, kapok or other suitable soft filling material as described in our prior patent specification aforesaid. Finally the neck opening in the doll's head is closed and such closure may be effected by stretching the neck so as to contract it over a disc or other rigid closure member provided on the end of a corresponding

neck portion of the doll's trunk so that the head is assembled in position on the trunk and the filling opening in the head closed at the same time.

- 5 Finally the head is suitably coloured on its exterior to provide the desired natural representations.

- 10 Other parts of toys both in the form of dolls and other shapes may be formed similarly by the present invention which may be applied to the production of one-piece complete dolls and other toys formed of an elastomer made as above described.

- 15 The characteristics of dolls and other toys made in accordance with the present invention as well as with the prior specification aforesaid, are that the material forming the toy is of sufficient thinness as readily to be deformed under the small
20 pressure exerted by the fingers of an infant as well as by an older child so that a very soft toy well adapted for use by infants and young children is provided, but at the same time by filling the

interior of the toy with a soft filling material permanent deformation of the 25 toy is prevented, the toy reverting to its original shape under the internal pressure exerted by the filling material when the external pressure of the child or infant 30 is removed, the amount of filling material which is inserted into the hollow interior of the polyvinyl chloride resin elastomer being carefully predetermined so as to achieve this result.

35 Thus there is produced a toy which is essentially of a soft and cuddly character whose softness and suppleness simulates that of a human baby which toy further possesses very little weight so that it is 40 eminently suitable for use by young children.

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